CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-XXXX
FOR
NORTH OF RIVER SANITARY DISTRICT NO.1
AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT FACILITY AND
WATER RECLAMATION
KERN COUNTY



This monitoring and Reporting Program (MRP) is required pursuant to California Water Code (CWC) section 13267.

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts or the Executive Officer issues a revised MRP. Changes to sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with ***Standard Provisions and Reporting Requirements for Waste Discharge Requirements***, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program). The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after at least 12 months of monitoring, the Discharger may request the MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

A glossary of terms used within this MRP is included on page 10 and a list of the constituents required for the monitoring of Priority Pollutants is included in Table 1, which is on page 11.

## INFLUENT MONITORING

Influent samples shall be collected at the inlet of the headworks of the WWTF. Time of collection of the sample shall be recorded. Influent monitoring shall include at least the following:

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Continuous | Flow | mgd | Meter |
| Weekly | pH | pH Units | Grab |
| Weekly | EC | µmhos/cm | Grab |
| Weekly | $BOD_5$ | mg/L | 24-hour composite |
| Weekly | TSS | mg/L | 24-hour composite |
| Monthly | Monthly Average Discharge | mgd | Computed |

## EFFLUENT MONITORING

Effluent samples shall be collected at a point in the system following treatment and before discharge to the effluent storage ponds or reclamation area. Time of collection of the sample shall be recorded. Effluent monitoring shall include the following:

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Weekly | pH | pH Units | Grab |
| Weekly | EC | µmhos/cm | Grab |
| Weekly | $BOD_5$ | mg/L | 24-hour composite |
| Weekly | TSS | mg/L | 24-hour composite |
| Monthly | Nitrate as N | mg/L | 24-hour composite |
| Monthly | TKN | mg/L | 24-hour composite |
| Monthly | Ammonia | mg/L | 24-hour composite |
| Monthly | Total Nitrogen | mg/L | Computed |
| Monthly | Total Dissolved Solids | mg/L | 24-hour composite |
| Monthly | Sodium | mg/L | 24-hour composite |
| Monthly | Chloride | mg/L | 24-hour composite |
| Annually | General Minerals | mg/L | 24-hour composite |
| Annually | Priority Pollutants (see Table 1) | Varies[1] | Varies |

[1] mg/L or µg/L, as appropriate.

## POND MONITORING

Permanent markers (e.g., staff gages) shall be placed in all ponds. The markers shall have calibrations indicating water level at the design capacity and available operational freeboard. Effluent storage and disposal pond monitoring shall include at least the following:

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Weekly | DO | mg/L | Grab |
| Weekly | Freeboard | Feet[1] | Grab |

[1] To nearest tenth of a foot

The Discharger shall inspect the condition of the disposal and/or effluent storage ponds weekly and record visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether grease, dead algae, vegetation, scum, or debris are accumulating on the pond surface and their location; whether burrowing animals or insects are present; and the color of the reservoirs (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.). A summary of the entries made in the log shall be included in the subsequent monitoring report.

## GROUNDWATER MONITORING

After measuring water levels and prior to collecting samples, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging is typically from 3 to 5 volumes of standing water within the well casing and screen, or additionally the filter pack pore volume.

The Discharger shall monitor all wells in its Groundwater Monitoring Network, and any additional wells installed pursuant to this MRP, for the following:

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Quarterly | Depth to groundwater | Feet[1] | Measured |
| Quarterly | Groundwater Elevation | Feet[2] | Computed |
| Quarterly | pH | pH Units | Grab |
| Quarterly | EC | µmhos/cm | Grab |
| Quarterly | Nitrate as N | mg/L | Grab |
| Quarterly | Total Nitrogen | mg/L | Grab |
| Quarterly | Total Organic Carbon | mg/L | Grab |
| Quarterly | Total Dissolved Solids | mg/L | Grab |
| Quarterly | Chloride | mg/L | Grab |
| Quarterly | Sodium | mg/L | Grab |

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Quarterly | Arsenic | µg/L | Grab |
| Quarterly | Iron | µg/L | Grab |
| Quarterly | Manganese | µg/L | Grab |
| Annually | General Minerals | mg/L | Grab |

[1] To nearest tenth of a foot
[2] To nearest tenth of a foot above Mean Sea Level

## SOURCE WATER MONITORING

For each source (either well of surface water supply), the Discharger shall calculate the flow-weighted average concentrations for the specified constituents utilizing monthly flow data and the most recent chemical analysis conducted in accordance with Title 22 drinking water requirements. Alternatively, the Discharger may establish representative sampling stations within the distribution system serving the same area as is served by the WWTF.

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Annually | EC | µmhos/cm | Computed average |
| Annually | General Minerals | mg/L | Computed average |

## SLUDGE MONITORING

Sludge shall be sampled for the following constituents:

| | | |
|---|---|---|
| Arsenic | Copper | Nickel |
| Cadmium | Lead | Selenium |
| Molybdenum | Mercury | Zinc |

Monitoring shall be conducted: using the methods is “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (SW-846), as required in Title 40 of the Code of Federal Regulations (40 CFR), Part 503.8(b)(4). The constituents listed above shall be monitored at the following frequency, depending on volume generated:

| Volume Generated (dry metric tons/year) | Frequency |
|---|---|
| 0 to 290 | Annually |
| 290 to 1,500 | Quarterly |
| 1,500 to 15,000 | Bimonthly (six samples per year) |
| Greater than 15,000 | Monthly |

The Discharger shall demonstrate that treated sludge (i.e., biosolids) meets Class A or Class B pathogens reduction levels by one of the methods listed in 40 CFR, Part 503.32.
The Discharger shall track and keep records of the operational parameters used to achieve Vector Attraction Reduction requirements in 40 CFR, Part 503.33(b).

## RECLAMATION AREA MONITORING

The Discharger shall perform the following routine monitoring and loading calculations for each discrete irrigation area within the Reclamation Area. Data shall be collected and presented in tabular format and shall include the following:

| Frequency | Constituent/Parameter | Units | Sample Type |
|---|---|---|---|
| Daily | Application Area | Acres | n/a |
| Daily | Wastewater flow | Gallons | Estimated |
| Daily | Wastewater loading | inches/day | Calculated |
| Daily | Supplemental irrigation | Gallons | Estimated |
| Daily | Precipitation | Inches | Rain gage[1] |
| Monthly | Total Hydraulic Loading[2] | inches/acre-month | Calculated |

[1] National Weather Service data from the nearest weather station is acceptable.
[2] Combined loading from wastewater, irrigation water, and precipitation.

In addition, the Discharger shall inspect the Reclamation Area on a weekly basis. Evidence of erosion, field saturation, runoff, of the presence of nuisance conditions (i.e., flies, ponding, etc.) shall be noted in field logs and included as part of the quarterly monitoring reports.

## REPORTING

All monitoring results shall be reported in **Quarterly Monitoring Reports** which are due by the first day of the second month after the calendar quarter. Therefore, monitoring reports are due as follows:

| | |
|---|---|
| First Quarter Monitoring Report: | **1 May** |
| Second Quarter Monitoring Report: | **1 August** |
| Third Quarter Monitoring Report: | **1 November** |
| Fourth Quarter Monitoring Report: | **1 February** |

**A transmittal letter shall accompany each monitoring report.** The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory.

The following information is to be included on all monitoring and annual reports, as well as report transmittal letters, submitted to the Central Valley Water Board:

Discharger Name
Facility Name
MRP Number
Contact Information (telephone number and email)

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. Monitoring data or discussions submitted concerning WWTF performance must also be signed and certified by the chief plant operator. If the chief plant operator is not in direct line of supervision of the laboratory function for a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

All monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

**A. All Quarterly Monitoring Reports** shall include the following:

**Wastewater reporting**

1. The results of influent, effluent, and pond monitoring specified on pages 2 and 3.

2. For each month of the quarter, calculation of the maximum daily flow and the monthly average flow.

3. For each month of the quarter, calculation of the 12-month rolling average EC of the discharge using the EC value for that month averaged with the EC values for the previous 11 months.

4. For each month of the quarter, calculation of the monthly average effluent BOD and TSS concentrations, and calculation of the percent removal of BOD and TSS compared to the influent.

5. A summary of the notations made in the pond monitoring log during each quarter. The entire contents of the log do not need to be submitted.

**Groundwater reporting**

1. The results of groundwater monitoring specified on pages 3 and 4.

2. For each monitoring well, a table showing constituent concentrations for at least five previous years, up through the current quarter.

3. A groundwater contour map based on groundwater elevations for that quarter. The map shall show the gradient and direction of groundwater flow under/around the facility and/or effluent disposal area(s). The map shall also include the locations of monitoring wells and wastewater storage and discharge areas.

**Reclamation Area reporting**

1. The results of the routine monitoring and loading calculations specified on page 5.

2. For each month of the quarter, calculation of the monthly hydraulic load for wastewater and supplemental irrigation water in million of gallons to each discrete irrigation area.

3. A summary of the notations made in the Reclamation Area monitoring log during each quarter. The entire contents of the log do not need to be submitted.

**B. Fourth Quarter Monitoring Reports**, in addition to the above, shall include the following:

**Wastewater treatment facility information**

1. The names, certificate grades, and general responsibilities of all persons in charge of wastewater treatment and disposal.

2. The names and telephone numbers of persons to contact regarding the WWTF for emergency and routine situations.

3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4).

4. A statement whether the current operation and maintenance manual, sampling plan, and contingency plan, reflect the WWTF as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.

5. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the previous five calendar years.

**Source Water reporting**, including the results of **EC** monitoring specified on page 4, and supporting calculations.

**Solids/Sludge monitoring**

1. Annual production totals in dry tons or cubic yards.
2. A description of disposal methods, including the following information related to the disposal methods used. If more than one method is used, include the percentage disposed of by each method.
   a. For landfill disposal, include: the name and location of the landfill, and the Order number of WDRs that regulate it.
   b. For land application, include: the location of the site, and the Order number of any WDRs that regulate it.
   c. For incineration, include: the name and location of the site where incineration occurs, the Order number of WDRs that regulate the site, the disposal method of ash, and the name and location of the facility receiving ash (if applicable).
   d. For composting, include: the location of the site, and the Order number of any WDRs that regulate it.

**Reclamation Area**

1. The type of crop(s) grown in the Reclamation Area, planting and harvest dates, and the quantified nitrogen and fixed dissolved solids uptakes (as estimated by technical references or, preferably, determined by representative plant tissue analysis).

2. The monthly and annual discharge volumes during the reporting year expressed as million gallons and inches.

3. A monthly balance for the reporting year that includes:

   a. Monthly average $ET_o$ (observed evapotranspiration) – Information sources include California Irrigation Management Information System (CIMIS) http://www.cimis.water.ca.gov/

   b. Monthly crop uptake

      i. Crop water utilization rates are available from a variety of publications available from the local University of California Davis extension office.

      ii. Irrigation efficiency – Frequently, engineers include a factor for irrigation efficiency such that the application rate is slightly greater than the crop utilization rate. A conservative design does not include this value.

c. Monthly average precipitation – this data is available at http://www.cimis.water.ca.gov/ or at http://www.ncdc.noaa.gov/oa/climate/online/ccd/nrmlprcp.html.

d. Monthly average and annual average discharge flow rate.

e. Monthly estimates of the amount of wastewater percolating below the root zone (i.e., amount of wastewater applied in excess of crop requirements)

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

_____
(Date)

DMS/dkp: 6/09/2009

## GLOSSARY

| | |
|---|---|
| $BOD_5$ | Five-day biochemical oxygen demand |
| CBOD | Carbonaceous BOD |
| DO | Dissolved oxygen |
| EC | Electrical conductivity at 25° C |
| FDS | Fixed dissolved solids |
| NTU | Nephelometric turbidity unit |
| TKN | Total Kjeldahl nitrogen |
| TDS | Total dissolved solids |
| TSS | Total suspended solids |
| Continuous | The specified parameter shall be measured by a meter continuously. |
| 24-Hour Composite | Samples shall be a flow-proportioned composite consisting of at least eight aliquots. |
| Daily | Samples shall be collected at least every day. |
| Twice Weekly | Samples shall be collected at least twice per week on non-consecutive days. |
| Weekly | Samples shall be collected at least once per week. |
| Twice Monthly | Samples shall be collected at least twice per month during non-consecutive weeks. |
| Monthly | Samples shall be collected at least once per month. |
| Bimonthly | Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months. |
| Quarterly | Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October. |
| Semiannually | Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October. |
| Annually | Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October. |
| mg/L | Milligrams per liter |
| mL/L | milliliters [of solids] per liter |
| µg/L | Micrograms per liter |
| µmhos/cm | Micromhos per centimeter |
| mgd | Million gallons per day |
| MPN/100 mL | Most probable number [of organisms] per 100 milliliters |
| General Minerals | Analysis for General Minerals shall include at least the following: |

| | | |
|---|---|---|
| Alkalinity | Chloride | Sodium |
| Bicarbonate | Hardness | Sulfate |
| Calcium | Magnesium | TDS |
| Carbonate | Potassium | |

General Minerals analyses shall be accompanied by documentation of cation/anion balance.

## Table 1. Priority Pollutant Scan

| ***Inorganics***[1] | ***Organics*** | 3-Methyl-4-Chlorophenol | Hexachlorobenzene |
|---|---|---|---|
| Antimony | Acrolein | Pentachlorophenol | Hexachlorobutadiene |
| Arsenic | Acrylonitrile | Phenol | Hexachlorocyclopentadiene |
| Beryllium | Benzene | 2,4,6-Trichlorophenol | Hexachloroethane |
| Cadmium | Bromoform | Acenaphthene | Indeno(1,2,3-c,d)pyrene |
| Chromium (III) | Carbon tetrachloride | Acenaphthylene | Isophorone |
| Chromium (VI) | Chlorobenzene | Anthracene | Naphthalene |
| Copper | Chlorodibromomethane | Benzidine | Nitrobenzene |
| Lead | Chloroethane | Benzo(a)Anthracene | N-Nitrosodimethylamine |
| Mercury | 2-Chloroethylvinyl Ether | Benzo(a)pyrene | N-Nitrosodi-n-Propylamine |
| Nickel | Chloroform | Benzo(b)fluoranthene | N-Nitrosodiphenylamine |
| Selenium | Dichlorobromomethane | Benzo(g,h,i)perylene | Phenanthrene |
| Silver | 1,1-Dichloroethane | Benzo(k)fluoranthene | Pyrene |
| Thallium | 1,2-Dichloroethane | Bis(2-chloroethoxy) methane | 1,2,4-Trichlorobenzene |
| Zinc | 1,1-Dichloroethylene | Bis(2-chloroethyl) ether | |
| Cyanide | 1,2-Dichloropropane | Bis(2-chloroisopropyl) ether | ***Pesticides*** |
| Asbestos | 1,3-Dichloropropylene | Bis(2-Ethylhexyl)phthalate | Aldrin |
| | Ethylbenzene | 4-Bromophenyl phenyl ether | alpha-BHC |
| ***Dioxin Congeners*** | Methyl Bromide | Butylbenzyl Phthalate | beta-BHC |
| 2,3,7,8-TCDD | Methyl Chloride | 2-Chloronaphthalene | gamma-BHC (Lindane) |
| 1,2,3,7,8-PentaCDD | Methylene Chloride | 4-Chlorophenyl Phenyl Ether | delta-BHC |
| 1,2,3,4,7,8-HexaCDD | 1,1,2,2-Tetrachloroethane | Chrysene | Chlordane |
| 1,2,3,6,7,8-HexaCDD | Tetrachloroethylene (PCE) | Dibenzo(a,h)Anthracene | 4,4'-DDT |
| 1,2,3,7,8,9-HexaCDD | Toluene | 1,2-Dichlorobenzene | 4,4'-DDE |
| 1,2,3,4,6,7,8-HeptaCDD | 1,2-Trans-Dichloroethylene | 1,3-Dichlorobenzene | 4,4'-DDD |
| OctaCDD | 1,1,1-Trichloroethane | 1,4-Dichlorobenzene | Dieldrin |
| 2,3,7,8-TetraCDF | 1,1,2-Trichloroethane | 3,3'-Dichlorobenzidine | alpha-Endosulfan |
| 1,2,3,7,8-PentaCDF | Trichloroethylene (TCE) | Diethyl phthalate | beta-Endosulfan |
| 2,3,4,7,8-PentaCDF | Vinyl chloride | Dimethyl phthalate | Endosulfan Sulfate |
| 1,2,3,4,7,8-HexaCDF | 2-Chlorophenol | Di-n-Butyl Phthalate | Endrin |
| 1,2,3,6,7,8-HexaCDF | 2,4-Dichlorophenol | 2,4-Dinitrotoluene | Endrin Aldehyde |
| 1,2,3,7,8,9-HexaCDF | 2,4-Dimethylphenol | 2,6-Dinitrotoluene | Heptachlor |
| 2,3,4,6,7,8-HexaCDF | 2-Methyl-4,6-Dinitrophenol | Di-n-Octyl Phthalate | Heptachlor epoxide |
| 1,2,3,4,6,7,8-HeptaCDF | 2,4-Dinitrophenol | 1,2-Diphenylhydrazine | Polychlorinated biphenyls |
| 1,2,3,4,7,8,9-HeptaCDF | 2-Nitrophenol | Fluoranthene | Toxaphene |
| OctaCDF | 4-Nitrophenol | Fluorene | |

[1] With the exception of wastewater samples, samples placed in an acid-preserved bottle for metals analysis must first be filtered. If filtering in the field is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain of custody form) to immediately filter then preserve the sample.

[2] Samples to be analyzed for volatile compounds and phthalate esters shall be grab samples; the remainder shall be 24-hour composite samples.